Conservators Take a Look Back in Time

Scholars of ancient Chinese bronze weapons have long pondered whether a dagger axe (c. third century B.C.) in the Art Institute's collection concealed a blade within its elaborately inlaid sheath. To answer that question and other mysteries, Associate Conservator of Objects Suzie Schnepp and A. W. Mellon Conservation Scientist Francesca Casadio brought the dagger and other selected Chinese bronzes to the Advanced Photon Source at Argonne National Laboratory in suburban Du Page County. One of the most technologically complex facilities in existence, it provides the brightest X-ray beams in the Western Hemisphere to scientists from around the world.

These high-energy X-rays enabled Schnepp and Casadio to peer back into the past to more fully understand how objects in the collection were made. Technically, synchrotron radiation is the energy emitted by charged particles (such as electrons or positrons) moving very close to the speed of light around a curved path.

At Argonne, invisible subatomic particles speed around a ring 1,225 feet in circumference (almost as high as the Sears Tower), producing energy that is critical for research. The intense ray of invisible light created allows scientists to analyze objects nondestructively, without having to take even the smallest scrapings of material. Argonne scientists used X-ray diffraction and a very specialized type of X-radiography (called phase-contrast X-ray imaging) to visually penetrate the Art Institute's dagger axe—otherwise a difficult task given the thickness and high lead content.

In the end, this advanced scientific analysis determined that the dagger's sheath does not contain a blade, confirming that it was cast as a single bronze piece to be used as a ceremonial object. As illustrated by this test, scientific inquiry not only tells us something about the techniques and materials used by ancient artists but also reveals the roles their objects played.

Traditional laboratory X-ray radiography of the dagger axe. The image shows the presence of silver inlays under the green corrosion layer but does not allow conservators to see if there is a blade concealed within the sheath. Right: Aerial view of the Advanced Photon Source (APS). Photo courtesy of Argonne National Laboratory.

Given the successful outcome of this project, Art Institute conservators are collaborating with both Argonne and Northwestern University on an extensive campaign to study ancient Chinese bronzes in the collection in order to understand their inner structure and casting technique. Additionally, the analysis of the metals and alloys used by modern artists Picasso, Brancusi, and Matisse will help conservators date and confirm the identity of foundries that produced their sculptures.

The Art Institute is thankful to the A. W. Mellon Foundation for its enlightened support of scientific research at the museum.

Severin Roesen's *An Abundance of Fruit* (c. 1860) shown in its new frame. Americana Fund.

Framing American Art

Frames can dramatically enhance—or diminish—the appearance of paintings, yet often original frames may be inappropriately replaced to suit changing tastes. Curators work closely with conservators and frame makers to choose period frames that better complement the style and date of the paintings in their collections. Last year, when the Department of American Art acquired *An Abundance of Fruit* (c. 1860), a still-life painting by Severin Roesen, it was surrounded by a heavily ornamented, thickly gilded frame that overwhelmed its graceful fruit motifs. After reviewing a number of possible choices with her colleagues, Sarah Kelly, Henry and Gilda Buchbinder Curator of American Art, selected an 1850s-era frame with a delicate scroll and foliate pattern in the cove and a refined laurel and berry decoration along the top edge. These naturalistic motifs harmonize beautifully with the painting's subject matter, particularly the spiraling tendrils of the grape leaves, making the frame a suitable and elegant choice. This effort is part of the department's ongoing project to reframe a number of works, including John Singer Sargent's *The Fountain, Villa Torlonia, Frascati, Italy*, which received a replica of an appropriate Italianate frame through the generosity of the Legacy Committee of the Auxiliary Board.